

Changes of WIF-1 and WT-1 genes expression following the anti-cancer effects of omega-3 and omega-6 on gastric cancer cells

Fataneh Abedi^a, Mehdi Sahmani^a, Sahar Moghbelinejad^a, Mehdi Azad^a, Babak Rahmani^a, Shaghayegh Pishkhan^a, Saeideh Gholamzadeh Khoei^b, Zahra Mohammadi Goldar^a, Nematollah Gheibi^a

^aCellular and Molecular Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran

^bMolecular Medicine Research Center, Hamadan University of Medical Sciences, Hamadan, Iran

Abstract

Gastric cancer is one of the most common cancers. Environmental factors, especially diet, play an important role in causing gastric cancer. The omega-3 (ω -3) and omega-6 (ω -6) from the polyunsaturated fatty acids (PUFAs) group as the natural compounds indicated significant effects on inhibiting various types of tumors. In this study, we investigated the anti-cancer properties of ω -3 and ω -6 on gastric cancer cells with focusing on WNT signaling pathway via WNT inhibitory Factor-1 (WIF-1) and The Wilms Tumor-1 (WT-1) genes. AGS cells were used to investigate the effects of ω -3 and ω -6 on cell viability, apoptosis and the expression of WIF-1 and WT-1 genes in gastric cancer. AGS cells were treated with different concentrations of ω -3 and ω -6 for 24, 48, and 72 h, and then cell viability was assessed by MTT assay. The apoptosis rate was assessed using the flow cytometry test in every three times. The mRNA expression of WIF-1 and WT-1 were examined by quantitative real-time PCR (qRT-PCR). Our study revealed that ω -3 and ω -6 provide various antitumor activities such as inhibition of cell viability in a dose and time-dependent manner. The results of flow cytometry showed that cytotoxicity effects are due to the ability of ω -3 and ω -6 to induce apoptosis. In addition, ω -3 and ω -6 significantly increased the expression of WIF-1, whereas WT-1 level decreased in AGS cells compared to the control group. These results suggested that ω -3 and ω -6 can serve as therapeutics in against gastric cancer by targeting of the WNT signaling pathway.